REMARKS

The applicant appreciates the Examiner's thorough examination of the application, and requests reexamination and reconsideration of the application in view of the preceding amendments and the following remarks.

The Examiner rejects claims 22-43, 44-46, and 50-51 and 67 under 35 U.S.C. §103(a) as being unpatentable over U.S. Pat. No. 4,078,867 to *Ronden* in view of U.S. Pat. No. 1,971,500 to *Palmer* in view of U.S. Pat. No. 6,016,848 to *Egres, Jr.* The Examiner also rejects claim 47 under §103(a) as being unpatentable over *Ronden* in view of *Palmer* in view of *Egres, Jr.* and further in view of U.S. Pat. No. 4,683,610 to *Richards et al.* The Examiner also rejects claims 48-49 under §103(a) as being unpatentable over *Ronden* in view of *Palmer* in view of *Egres, Jr.* and further in view of U.S. Pat. No. 5,598,598 to *Sorenson*.

The applicant will address the Examiner's rejections and the cited references first with respect to the features of applicant's independent claim 50. Thereafter, the applicant will address the Examiner's rejections and references with respect to the features recited in the applicant's remaining independent claims, although many of the same arguments will also apply to claim 50 with equal force, for the reasons set forth.

THE APPLICANT'S INDEPENDENT CLAIM 50

To advance prosecution, the applicant has amended claim 50 to recite the embodiment of a collapsible and deployable truss structure including a plurality of joined members, with a selected number of said members each including a tube made of layers of material, and at least one predetermined hinge area along the length of the tube. A plurality of opposing elongated slots

in the tube at the hinge area thereof forming separated longitudinal strips of tube material between the slots, and the tube is configured to fold at the hinge area only when the longitudinal strips of tube material are subjected to localized buckling forces directly to the hinge areas.

The applicant's claimed truss structure is strong under compression, strong against bending and torque. For support, see for example the applicant's specification at page 10, lines 7-10 as well as page 11, lines 12-13 and Figs. 1-3 and Figs. 6-8.

None of these claimed structural features nor their resulting functions are taught by *Ronden* and/or *Palmer* and/or *Egres*.

Ronden teaches a traffic marker post is of "substantially continuously curviform transverse cross section". See e.g. *Ronden* at column 3, lines 15-19.

In contrast to the applicant's claim 50, *Ronden* fails to teach: (1) a collapsible and deployable truss structure; or (2) a plurality of joined members; or (3) a plurality of opposing slots in the tube at a hinge area thereof; or (4) opposing longitudinal strips of material between the slots; or (5) the tube configured to fold at the hinge area only when the longitudinal strips of tube material are subjected to localized buckling forces directly to the hinge areas.

Ronden further fails to teach that the traffic marker post supports anything at all, ever, or that it could be part of a truss structure.

As noted previously, one skilled in the art of truss structures and/or the members thereof would recognize that a closed wall shape "of substantially continuously curviform cross-transverse cross-section" as taught by *Ronden* would not maintain its structural integrity when folded, but instead would yield at local points around the perimeter, altering the tube structure at

those yield points.

In this regard *Ronden* itself teaches that after being struck by a vehicle, the traffic marker post exhibited "only slight signs of crimping at the point at which the post bent". See *Ronden* column 5, lines 40-46.

In contrast to the applicant's trus s structure of claim 50, crimping, for example, is not a concern of *Ronden*. *Ronden* simply teaches a homogeneous tubular traffic marker post. It is clear that the strength and precise return position of that tube is not critical. If the *Ronden* tube were a load bearing structural member such as the applicant's truss str ucture of claim 50, however, its strength, stiffness, and positional accuracy would be substantially reduced by the local perimeter yielding.

Further, the Examiner admits that *Ronden* fails to disclose "the tube being made of a [sic] layers of material, at least one predetermined hinge area along the length of the first tube, a plurality of opposing elongated slots in the tube through the layers of material forming separated longitudinal strips of tube material between the slots which fold when subjected to localized buckling forces".

It is such additional elements however, as claimed by the applicant, that contribute to – among other things – maintaining structural integrity. *Ronden* would have no motivation to utilize such additional elements because, as noted above, *Ronden* is not at all concerned with supporting weight or the consequences of local material yielding.

Nonetheless, to fill the void in the teachings of *Ronden*, the Examiner cites *Palmer*.

Palmer teaches a hose connection which enables a hose to be joined to a hydrant or faucet located in an awkward or out of the way place. See e.g. *Palmer* at column 1, lines 7-10.

Thus, *Palmer*'s webs 3 clearly would bend when any force at any point on the hand grip member is applied, even if forces were not applied directly to the web 3. Also, *Palmer*'s webs 3 clearly are not capable of supporting anything, in any configuration, and could not form part of a truss structure. This is in contrast to the applicant's claim 50.

Additionally, *Palmer*'s slots 1b in the shield 4 are to provide a sufficient grip without getting the gripper's hands dirty. See e.g. *Palmer* at column 1, lines 15-19 and column 2, lines 82-85.

Thus it is clear that *Palmer*'s shield 4 would collapse under the gripper's hand no matter where force is applied, even if forces were not applied directly to the material between the slots. Also, *Palmer*'s slots would not be capable of supporting anything, in any configuration, and could not form part of a truss structure. This is also in contrast to the applicant's claim 50, which recites, among other elements, that the tube is configured to fold at the hinge area only when the longitudinal strips of tube material are subjected to localized buckling forces directly to the hinge areas.

Further, as taught by *Palmer* itself, any suitable means which provides a sufficient grip would readily take the place of the slots shown. The slots are not a critical aspect of even *Palmer*'s own hose gripper.

It is clear therefore, that the teachings of *Ronden* and *Palmer* fail to teach the elements of applicant's claim 50. (Moreover, *Ronden* and *Palmer* are from entirely different fields of endeavor, and are not concerned with the applicant's field of endeavor or the problems with which the applicant was concerned and which the applicant solved. This is discussed more fully below to address the Examiner's Response to Arguments.)

The tertiary cited reference *Egres* fails to add to the lack of teaching of *Ronden* and *Palmer* in order to render the applicant's claim 50 obvious. *Egres* merely teaches flexible layered flouropolymer tubes and methods of making them, and fails to teach other elements of the applicant's claim 50. Moreover, the Examiner has cited *Egres* only for the alleged proposition that *Egres* teaches a tube made of layers of material to withstand repeated flexing due to bending.

Accordingly, for at least the foregoing reasons (and the reasons below), the applicant's independent claim 50, and claim 51 which depends from claim 50, are in condition for allowance.

THE APPLICANT'S INDEPENDENT CLAIMS 22 and 67

The applicant's independent claim 22 recites a foldable member including at least a first tube made of layers of material. There is at least one predetermined hinge area along the length of the first tube. There are a plurality of opposing elongated slots at the predetermined hinged area in the tube through the layers of material forming separated longitudinal strips of layers of tube material between the slots, and the tube is configured to fold at said hinge area when said longitudinal strips of material are subjected to localized buckling forces.

The Examiner cites *Ronden* as teaching "a foldable member comprising at least a first tube (4)". The Examiner admits that *Ronden* fails to teach any of the applicant's other claimed elements, stating in pertinent part (with emphasis added) that:

> Ronden does not show the tube made of a layers of material, at least one predetermined hinge area along the length of the first tube, a plurality of opposing elongated slots in the tube through the layers of material forming separated longititudinal strips of tube material between the slots, said tube configured to fold when subjected to localized buckling forces.

The Examiner therefore essentially proposes that "one having ordinary skill in the art" would modify *Ronden* with the teachings of *Palmer* (as well as *Egres* – *Egres* allegedly teaching "a tube made of layers of material to withstand repeated flexing due to bending").

The Examiner has failed to observe established law for the analysis of claim elements and references, and has failed to make out a *prima facie* case of obviousness.

Ronden teaches a traffic marker post. *Ronden* teaches that as opposed to wooden posts which are sheared off, *Ronden*'s solitary traffic marker post will return substantially to its upright position promptly after being traversed by a vehicle. *Ronden* further teaches that the traffic marker post:

> ... is installed by being inserted in a dug hole ... the space between the wall of the hole and the post being filled with sand ... Additionally, the post itself is filled with sand, to approximately ground level".

See e.g. *Ronden* Title and claims; column 1, line 67 – column 2, line 2; and column 4, lines 1-6 (with emphasis added) and Fig. 1.

Palmer teaches a 1934 hose connector. *Palmer*'s hose connector provides:

> ...a hose connection which enables a hose to be joined to a hydrant or faucet located in an awkward or out of the way place ...
>
> ... a hose connection which eliminates the need of grasping the hose itself when making a connection thereby reducing the danger of soiling ones hands when connecting the hose ...
>
> ...If desired, the surface of the shield 4 may be arranged with slots 4*b* or any other suitable means which provides a sufficient grip ...

See e.g. *Palmer* at column 1, lines 7-10 and 15-19 and column 2, lines 83-85 (with

emphasis added).

The rejection therefore begins with (A) a homogeneous relatively stiff traffic marker post buried in dirt and filled with dirt to ground level for being run over by automobiles (*Ronden*), then adds (B) a 70 year old hose malleable hose connector with slots for a better hand grip while keeping the gripper's hands clean (*Palmer*), in order to reject (C) the applicant's foldable member as claimed in applicant's claims 22 and 67.

This is untenable under the law, as discussed below.

The Examiner alleges that *Ronden* is "a tubular member which needs to be bent", that "Palmer discloses a tube that is able to bend due to its opposing slots", and alleges that "applicant's invention is to allow bending of a tubular member". The Examiner then concludes that "the references are reasonably pertinent to the particular problem with which the applicant was concerned". In support of this rationale the Examiner cites *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992).

The applicant respectfully submits the Examiner's reliance on *Oetiker* is misplaced.

The applicant was concerned with the problems associated with foldable and deployable structures (and the foldable members of which they are comprised), for example in space flight – where compactness and light weight are important. Thus, foldability and deployability are also important. Further, precision is also a factor, e.g. deployable structures must be stable and return to their original shapes when deployed from a collapsed or compact configuration to an expanded configuration. See e.g. the applicant's specification at page 3, line 8 – page 4, line 12; and see for example the discussion of a prior art steel spring hinge design and its shortcomings at page 5, lines 11-23.

One of the applicant's solutions to the disadvantages of the (pertinent) prior art was the truss structure of claim 50. See for example, the applicant's specification at page 9, line 16 – 10, line 6 where it states:

> Truss structure 10, Fig. 1, of this invention includes a plurality of joined truss members 12 and 14 as shown. Truss structure 10, for example, may be 1.25 meters tall but collapsible to a height of 27 centimeters as shown in Fig. 2 due to the foldable nature of truss member 12 (and other selected truss members) which includes hinge areas 16, 18, and 20 along its length.
>
> Depending on its specific design, hinge area 16 may fold downward, hinge area 20 may fold upward, and hinge area 18 may fold in the direction out of the plane of the drawing.
>
> When collapsed as shown in Fig. 2, the volume of truss structure 10 is sharply reduced resulting in significant space savings for space flight.
>
> Upon deployment in outer space, however, truss structure 10 automatically expands as shown in Fig. 3 to its original configuration and may be used as a frame for solar panels, various optical devices, or as a part of a superstructure when joined to similar structures.

The applicant's claimed invention results from the realization that a lighter and more dimensionally stable, foldable member can be constructed by cutting and forming longitudinal slots in a tube around the perimeter thereof at a location where the member is designed to bend, thereby forming separated, longitudinal strips of material at that location. These longitudinal strips of material easily buckle, allowing the member to fold without adding a separate hinge which would add weight to the member and would also result in dimensional instability. See e.g. the applicant's specification at page 6, line 22 – page 7, line 4. Thus, a collapsible truss structure formed of the foldable members as claimed may collapse and be highly compact for storage.

Conversely, the hinge area of such foldable members is strong against bending and torque

when deployed. See e.g. the applicant's specification at page 10, lines 9-10. Thus, a collapsible truss structure formed of foldable members may be deployed (automatically) to its original configuration with greater precision.

With respect to *In re Oetiker* cited by the Examiner, the Court found that "[i]t has not been shown that a person of ordinary skill, seeking to solve a problem of fastening a hose clamp, would reasonably be expected or motivated to look to fasteners for garments". See *In re Oetiker*, *supra*, at page 1446 (with emphasis added).

In this case, it is clear that the Examiner has not shown that a person of ordinary skill in the art of foldable members seeking to solve the problem of precision folding and unfolding for compact storage and deployability, would reasonably be expected or motivated to look to a claimed composition to be used for traffic markers struck by cars (*Ronden*), or to a hose clamp gripping member for keeping one's hands clean and to provide a better grip (*Palmer*) – much less a combination of such references.

Moreover, after finding as stated above, the *Oetiker* court held that:

> The combination of elements from non-analogous sources, in a manner that reconstructs the applicant's invention only with the benefit of hindsight, is insufficient to present a *prima facie* case of obviousness." *In re Oetiker* at 1446.

The applicant submits that a tribunal would find the same result here. Specifically, it is only with the benefit of hindsight that the applicants' claims have been reconstructed from at least two non-analogous sources (*Ronden* and *Palmer*). Neither *Ronden* nor *Palmer* are pertinent to each other or to the applicant's claimed invention. A *prima facie* case of obviousness has not been presented by the Examiner.

Moreover, it is improper to analyze the applicant's claims in such a narrow fashion – i.e.

as something which allows bending. Instead, proper analysis requires that the applicant's claims must be analyzed "as a whole". See MPEP §2141.02 I. (THE CLAIMED INVENTION MUST BE CONSIDERED AS A WHOLE).

In addition, pending claims must be given their broadest reasonable interpretation consistent with the specification. See MPEP §2111.

It is clear from the Examiner's rationale for combining *Ronden* and *Palmer* that the Examiner has failed to consider the claims as a whole, and has failed to give the claims their broadest reasonable interpretation consistent with the specification.

Further, the references must be considered in their entirety. See MPEP §2104.02 VI (PRIOR ART MUST BE CONSIDERED IN ITS ENTIRETY, INCLUDING DISCLOSURES THAT TEACH AWAY FROM THE CLAIMS).

It is clear from the Examiner's narrow interpretation of *Ronden* and *Palmer* and from the disregard of their teachings that the Examiner has failed to consider the references in their entirety.

(The cited reference *Egres Jr.* does not add to *Ronden* and *Palmer* in order to support the rejection of applicant's claims. As noted, the Examiner cites *Egres, Jr.* as disclosing a tube made of layers of material to withstand repeated flexing due to bending. *Egres, Jr.* also fails to disclose predetermined hinge area(s), or slots in the tubes, or opposing longitudinal strips of layers of tube material, or a tube made of layers of material configured to fold at a hinge area only when longitudinal strips of material in that area are subjected to localized buckling forces. Thus, *Egres, Jr.* fails to disclose elements claimed by the applicant which *Ronden* and *Palmer* also fail to disclose as discussed above.)

Accordingly, independent claims 22 and 67 are in condition for allowance. Claims 23-49

as amended depend directly or indirectly from independent claim 22. Accordingly, claims 23-49 are also in condition for allowance for at least the same reasons.

The many distinctions between the applicant's claimed invention and the *Richards et al.* cited reference have been discussed in prior Responses, and in any event, dependent claim 47 ultimately depends from independent claim 22. Also, dependent claims 48-49 also ultimately depend from claim 22 and are also allowable for at least the foregoing reasons, in spite of the *Sorenson* cited reference and/or which teaches a paint applicator with an extensible handle.

CONCLUSION

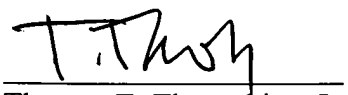
In summary, the applicant respectfully submits that the Examiner has failed to present a *prima facie* case of obviousness with respect to any of the applicant's claims.

Each of Examiner's rejections has been addressed or traversed.

Accordingly, it is respectfully submitted that the application is in condition for allowance. Early and favorable action is respectfully requested.

If for any reason this Response is found to be incomplete, or if at any time it appears that a telephone conference with counsel would help advance prosecution, please telephone the undersigned or his associates, collect in Waltham, Massachusetts at (781) 890-5678.

Respectfully submitted,



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